

BRITISH COLUMBIA'S UNPRECEDENTED REFORESTATION CHALLENGE

By

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The area of inadequately restocked or reforested land in British Columbia is today larger than at any point in the history of forest management in the province, which began in 1912 with the creation of the province's Forest Service. In fact, this area known in forestry parlance as NSR or Not Satisfactorily Restocked is nearly three times greater than it was 25 years ago when the provincial government in tandem with the federal government embarked on concerted efforts to address what was then a reforestation challenge of the first order. Not only is today's reforestation challenge so much greater than in the past, but the growth in NSR continues, and will likely worsen in the face of continued provincial inaction.

To give context to the present challenge a brief look at the past is instructive. In 1976, British Columbia's NSR stood at 3.9 million hectares (see Table 1). By the 1980's it was considered so outrageous that it precipitated a crisis in forest management, critical national media coverage ¹ and a federal response of \$50 million from 1979 to 1984 and over \$457 million ² from 1985 to 1995 to assist the province in reforestation.

The reforestation crisis of the 1980s was not only informative because of the sustained public investments that resulted but also because it led the province to enact new laws in 1987 that made it a legal requirement for logging companies to reforest the lands that they logged. It also required the provincial government to come up with reforestation plans on lands not logged by companies but subject to disturbances such as forest fires and insect and disease outbreaks that reduced healthy forest cover. Fifteen years later, however, the provincial government reversed its position. It rescinded its own reforestation responsibilities and relaxed reforestation rules for forest companies over hundreds of thousands of hectares of forestland that would subsequently be logged under what became known as "small-scale salvage" operations ³.

So why should we care about NSR? Well, the most obvious reply is that forestland in British Columbia is by and large public land. Whenever such lands are inadequately restocked or reforested questions are rightly asked about impacts on our environment and economy. Given the unprecedented estimated area of NSR – over nine million hectares, an area three times the size of Vancouver Island – and the wholly inadequate forest ministry response through inventory surveys and tree planting, the public interest is not being served and forest management on publicly owned lands in British Columbia is unsustainable.

¹ For example, see Fromm, Barbara. 1987. "The replanting of a nation". CBC: *The Journal*. September 30, 1987, at: http://archives.cbc.ca/environment/environmental_protection/topics/679-3915/

² Ministry of Forests. 1999. Draft "Incremental Silviculture Strategy for British Columbia". L.P. Atherton & Associates

³ The forests ministry does not track the amount of forestland logged under the small-scale-salvage program in its RESULTS database and can only guess at the amount of NSR accumulated without obligation to reforest. NSR estimates range between 200,000 and 500,000 hectares.

Given that the forest ministry estimates the forested area from which timber is harvested to be about 23 million hectares, the present extent of NSR means that a staggeringly high percentage (possibly 25 per cent) of its forestlands available for timber are not growing trees to their productive potential. In the past, such neglect was of concern to British Columbians. The question is whether today's neglect – an order of magnitude greater than that of nearly three decades ago – will result in a similar upwelling of concern. For the sake of our environment and forest sector, which is still a significant part of our provincial economy, one hopes so.

In a 1989 poll by Environics, an overwhelming number of British Columbians surveyed – 82 per cent – responded that too few trees were being planted. While not necessarily a critical issue on which the 1991 provincial election would be decided, reforestation was obviously a key topic in the election manifestos of the major political parties.⁴

Twenty years later, with a provincial election looming, does a largely urban electorate in Vancouver and Victoria care about the management of its forests and the rural communities that depend on them? The answer will be shaped in part by how well the media and responsible citizens communicate and expose a deliberate betrayal of public trust – this government's mismanagement of the public's forest estate – and how the political leadership hopefully respond.

Already citizens are expressing concern about their forests and environment. They are debating government mismanagement of B.C.'s publicly owned forestlands in recent opinion editorials, letters to the editor, feature articles and comment in the *Vancouver Sun*, in Victoria's *Times Colonist*, in *Focus* magazine and other publications and on a growing number of web sites and blogs (see Appendix 1).

WHY SHOULD WE CARE ABOUT THE PRESENT REFORESTATION CRISIS? British Columbia's forest estate is among one of its most valuable public assets, with the timber alone worth \$0.25 trillion⁵ and, when all natural capital and ecosystem services are included, a trillion dollars. Present mismanagement of our shared, publicly owned forest estate has enormous economic and ecological consequences: ghost communities, salmon survival and degraded drinking water supplies to name three important ones. The more we allow the inadequately reforested land base to grow unchecked, the poorer the public interest is served. Addressing the accumulated NSR, then, is a public policy issue of the first order and requires an open, honest accounting of just how significant the area of NSR is and what may be required by way of public reforestation investments to begin to restore the land base to a healthier state.

HOW IMPORTANT IS NSR? On the Western Silvicultural Contractors' Association (WSCA) web site, executive director John Betts has penned an article aptly titled "NSR in BC: Too important for guesswork" (July 20, 2010). How right he is.

To know the area of NSR resulting from logging activities as well as from fire and pest disturbances relative to the total area of productive forestland within provincial forests is critical to forest planning and management in British Columbia.

In a letter to the *Times Colonist* newspaper (June 12, 2010), provincial Forests Minister Pat Bell suggests that the area of insufficiently reforested land that would be economically feasible to

⁴ Brown, R.G. 1995. "Public influence on reforestation in British Columbia". A paper prepared for the Third Global Conference on Paper and the Environment, London, U.K.

⁵ Ministry of Forests, Mines and Lands. 2009. "Key BC silviculture statistics". Presentation: Silviculture discussion paper. Anthony A. Britneff, RPF (ret), January 2011

replant is in the vicinity of 0.24 million hectares⁶, a not insignificant figure, but far below the 2.3 million hectares conservatively estimated in this paper and based on various professional sources. Bell's figure is an even farther cry from the estimated total NSR, which this paper pegs at 9.1 million hectares. How these estimates are arrived at will be explained momentarily.

In British Columbia, the province's chief forester sets the stocking standards that are the benchmark by which foresters manage forest renewal. The number of healthy "free-to-grow" trees on a reforested site will determine whether or not the site is considered NSR or not.

The chief forester also, theoretically at least, uses NSR statistics to help determine what forest companies will be allowed to log on public lands. This decision is known as the allowable annual cut or AAC determination, a determination that also includes reviews of government and industry performance in forest management programs related to the protection, conservation and maintenance of forest resources.

NSR is also rightly considered by many forest professionals to be a strong indicator of whether or not sustainable forest management is being carried out.

Most forest sites disturbed by logging, fire, wind, insects or disease will regenerate eventually. If a return to satisfactory stocking with trees is not expected within 30 years, then the site is supposed to be excluded from timber-yield calculations that feed into the chief forester's critical AAC determinations.

NSR statistics come from two primary sources: inventory surveys and silvicultural surveys. Therefore, the Ministry of Forests, Mines and Lands records two types of NSR: inventory gross NSR and silviculture net NSR (see Table 1).

Provincial government inventory specialists, most working under contract to the province, classify the land. In theory, provincial silviculture staff take inventory gross NSR land classifications, factor them for natural regeneration, for accessibility and operability, and for potential return-on-investment (ROI), netting out all low (and often poor) sites to determine silviculture net NSR (the area deemed economically feasible and practicable to plant).

These and other critically important processes have, however, been subject to sustained personnel and funding cuts in the past decade. In 2002, for example, the provincial government cut ministry funding for its reforestation program by 90 per cent. Also that year, it rescinded its legal responsibility for the reforestation of areas disturbed by wildfire and pests and for the conducting and maintenance of a forest inventory. These moves effectively removed the legal requirements that British Columbians might subsequently use to hold the government accountable for a ballooning NSR.

The provincial government is losing its ability to define and assess adequately the sustainability of the public's forest estate as evinced by the third edition (2010) of the report titled *The State of British Columbia's Forest*. The report notes that the inventory for just under three quarters of the province's total forest estate – 74 per cent – which is supposed to be re-surveyed or re-inventoried

⁶ Such lands are sometimes referred to as the "silviculture net NSR" because they are a net-down of the inventory gross NSR.

every 10 years -- is now 25 years or more out of date. The authors of the report underscore the relationship between an outdated inventory and unsustainable forest management saying:

*Complete and up-to-date forest inventories support informed forest management decisions. The adage "You can't manage what you don't measure" applies to the practice of sustainable forest management.*⁷

Such realities take on added significance when one considers the tremendous, rapid landscape-level changes underway in many forests in the province: for example, in the interior's pine-dominated forests which have been subject to the well-documented, widespread mountain pine beetle (MPB) attack.

With the forest ministry's emphasis on timber extraction, the former Research Branch of the forests ministry provides cumulative figures for the timber volume of mature or older pine trees impacted by the beetle attack as well as cumulative areas affected pegging the area affected by mountain pine beetle by 2009 at 16.3 million hectares.⁸

Given that the forest ministry has conducted NSR surveys on only a fraction of those lands -- 360,000 hectares out of 17.38 million hectares of forestland disturbed by the mountain pine beetle (16.3 million hectares) and fire (1.08 million hectares) since 1998⁹ (see Table 2) -- we have to estimate the area of inventory gross NSR and silviculture net NSR based on the public record and on empirical evidence from the field.

WHAT DO WE KNOW? The public record of areas of inventory gross NSR and silviculture net NSR and of areas disturbed by wildfire and pests is found in the *Forest and Range Resource Analysis* (1984), in Ministry of Forests and Range annual reports, and on various ministry web sites (see Tables 1 and 2). The 2010 edition of *The State of British Columbia's Forests* also provides information. All are unhelpful in providing a complete portrayal of the reforestation challenge.

Table 1 provides the public record of areas burnt by wildfire and disturbed by insects and disease and of associated NSR data. The inadequacy of that record is dramatically illustrated by Chart 1, in which the reader can readily grasp how the NSR impact of vast areas of disturbance by mountain pine beetle and fire (red area) is not being captured in the forest ministry's inventory (blue area) and in the NSR area identified as being economically feasible to plant (green area). All of which when contrasted with Table 2 -- the public record of fire -and MPB-disturbed areas surveyed for NSR and planted -- make the publicly funded forests-for-tomorrow reforestation investments look pathetic: only 26,680 hectares of an estimated 2.3 million hectares have been planted since the government terminated its previous reforestation program in 2002.

⁷ Province of British Columbia, Ministry of Forests, Mines and Lands. 2010. "The State of British Columbia's Forests", 3rd edition. Victoria: page 232

⁸ Ministry of Forests and Range, Research Branch. 2009. "Provincial-level projection of the current mountain pine beetle outbreak: Year 7 at: <http://www.for.gov.bc.ca/hre/bcmapb/Year7.htm> Also see Province of British Columbia. 2010. "Facts about B.C.'s Mountain Pine Beetle". Updated March 2010, 2 pages http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/Updated-Beetle-Facts_Mar2010.pdf

⁹ Pat Bell, *Times Colonist*, June 12, 2010

Table 1. NSR statistics and areas disturbed by wildfire, by pests and by MPB and fire combined ¹⁰

Year	Wildfires –Area Burned (ha) Annual data (no area overlap)	Pests – Area Affected (ha) Generic data (area overlap)	MPB + Fire – Area Affected (ha) Cumulative data ¹¹	Inventory Gross NSR (ha) Not Stocked (NSR,NCBr, DSD)	Silviculture Net NSR (ha) Backlog + Current NSR
1955 ¹²				4,801,409	
1976 ¹³				3,888,034	
1984 ¹⁴				3,386,928	738,000
1988-89	11,482	688,526		3,779,000	1,972,151
1989-90	25,380	392,180		3,836,000	1,862,853
1990-91	75,781	679,785		3,836,000	1,968,864
1991-92	30,914	787,074		3,785,000	1,529,480
1992-93	30,452	1,301,053		3,617,000	1,362,407
1993-94	4,709	1,367,000		3,242,000	1,290,233
1994-95	30,370	511,701		3,016,000	1,050,611
1995-96	48,080	287,017		2,964,000	956,988
1996-97	14,952	24,808		2,844,000	827,938
1997-98	1,870	DNA ¹⁵		2,752,000	752,732
1998-99	71,769	2,352,175		2,826,000 ¹⁶	687,241
1999-00	13,989	3,729,741	2,313,781	2,779,000	642,207
2000-01	16,407	3,545,876	3,504,892	2,762,000	642,529
2001-02	9,762	3,912,649	4,490,974	DNA	633,903
2002-03 ¹⁷	20,471	4,009,051	5,467,829	DNA	603,193
2003-04	265,053	7,709,594	7,304,338	DNA	570,461
2004-05	220,518	10,618,639	9,476,472	DNA	611,055
2005-06 ¹⁸	34,588	11,388,422	11,359,620	DNA	654,781
2006-07	139,265	11,818,680	12,560,517	DNA	696,240
2007-08	29,440	12,784,194	14,259,381	DNA	725,528
2008-09	13,211	9,642,872	15,239,440	DNA	750,431
2009-10	242,170	13,246,896	17,261,754 ¹⁹	DNA	722,731

¹⁰ Sources: Forest and Range Resource Analysis 1984; Ministry of Forests and Range annual reports, forest health Annual Overview Surveys; government presentations; and forest ministry web sites.

¹¹ Ministry of Forests, Mines and Lands. MPB cumulative area estimates are based on the 1999 to 2009 provincial aerial overview of forest health and on output from the BCMPB projection model (version 7). See

<http://www.for.gov.bc.ca/hfp/health/overview/overview.htm> <http://www.for.gov.bc.ca/hre/BCMPB>

¹² Brown, R.G. 1995. "Public influence on reforestation in British Columbia". Victoria, B.C. Ref. to Sloane Report 1956

¹³ Brown, R.G. 1995. "Public influence on reforestation in British Columbia". Victoria, B.C. Ref. to Pearse Report 1976

¹⁴ Forest and Range Resource Analysis 1984

¹⁵ DNA. Data Not Available

¹⁶ 2,826,000 hectares is in stark contrast to the not stocked area of 3,186,832 hectares also dated 1998 and currently posted on the MFML Forest Analysis and Inventory Branch website. How does the ministry explain this disparity of 360,832 hectares for the same not stocked classification in the same year?

¹⁷ In 2002, the provincial government cut ministry funding for the reforestation program by 90 per cent. Also, it rescinded its legal responsibility for reforestation of areas disturbed by fire and pests and for maintaining a forest inventory.

¹⁸ In 2005, the provincial government started the forests for tomorrow program after doing no reforestation for three years.

¹⁹ Between 1999 and 2009, the MPB had affected 16.3 million hectares and wildfire had burned 1.0 million hectares (Source: Ministry of Forests, Mines and Lands). The total cumulative area of forest mortality for all pests might be as large as 18 million hectares since fiscal year 1989.

Anthony A. Britneff, RPF (ret), January 2011

Chart 1. Cumulative areas by year for inventory gross NSR, for silviculture net NSR and for MPB and fire combined

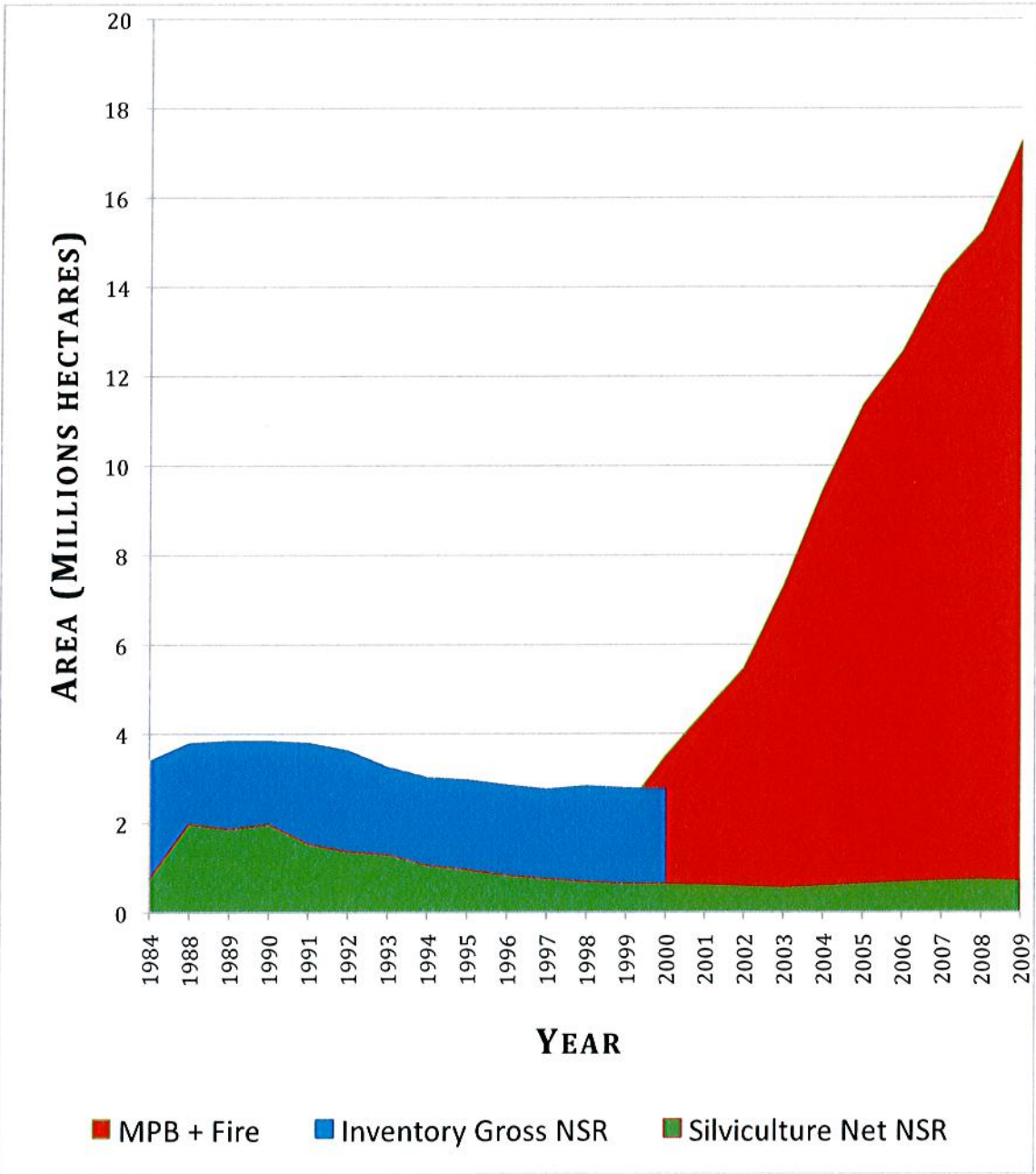


Table 2. Areas surveyed and planted under the Forests-For-Tomorrow (FFT) program by fiscal year

Year	Source	Planted (hectares)	Surveyed (hectares)
2005/06	FFT Annual Report	350	76,600
2006/07	FFT Annual Report	830	32,800
2007/08	FFT Annual Report	6,500	60,100
2008/09	FFT Annual Report	7,000	115,000
2009/10	FP&I Branch, MFML	Estimated 12,000	Planned 80,000
Totals		≈26,680	≈364,500 ²⁰

In Chart 1, using data on the public record from Table 1, it is clearly evident that:

1. The forest ministry abruptly stopped reporting on the status of inventory gross NSR (blue area) in 2000/01 at a time that overlaps with an exponential rise in area disturbed by fire and the mountain pine beetle infestation (red area).
2. Since the start of the mountain pine beetle infestation, the area of silviculture net NSR (green area) has remained more-or-less unchanged reflecting mostly the forest industry's reforestation of logged areas only; and it remarkably started to decline in 2009-10 when disturbance by the mountain pine beetle and wildfire was peaking.

Such a trend line for silviculture net NSR (green area in Chart 1) stands in stark contrast to what provincial and federal government forest scientists say. For example, David Coates of the Smithers office of the Ministry of Natural Resource Operations (MNRO) is a renowned authority on secondary structure in forests that have been attacked by mountain pine beetles. Secondary structure can be defined as the underlying trees beneath the taller older trees. Coates' estimate based on field studies in north central BC is that:

*... 20 to 25% of the area affected had very low levels of stocking and would be considered NSR by just about any criteria. Another 40 to 50% of the area is stocked with green trees but depending on species suitability criteria and well-spacing criteria may or may not be NSR. Some 25 to 30% is clearly well stocked.*²¹

Similarly, Philip Burton of the Canadian Forestry Service has studied the variation in forests attacked by mountain pine beetles and drawn conclusions that many such forests are adequately stocked with trees while others are less so:

*... available data indicate that pure pine stands constitute a minority of the forest area affected by the mountain pine beetle ... and that more than 40% of stands dominated by lodgepole pine ... have adequately stocked understories.*²²

²⁰ In his letter to the *Times Colonist* ("Replanting trees still the law", June 12, 2010), forest minister Pat Bell states that the ministry had surveyed 360,000 hectares of forestland disturbed by the 2003 and 2004 fires and by the MPB and had found 240,000 hectares of NSR (also see Table 2).

²¹ Coates, Dave. Personal communication (January 10, 2011)

²² Burton, P.J. 2006. "Restoration of forests attacked by mountain pine beetle: Misnomer, misdirected, or must-do?" *BC Journal of Ecosystems and Management* 7(2): 1-10

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Furthermore, a study by forest health staff with the forestry division of the Province of Alberta concluded that in British Columbia 40 to 70 per cent of the area disturbed by mountain pine beetle is not sufficiently stocked with healthy numbers of living trees:

*... recent surveys in post-MPB outbreak areas of central-interior British Columbia have indicated that 30 to 60% of the sites surveyed can be considered satisfactorily stocked.*²³

Finally, in a study undertaken by Churlish Consulting Ltd. and Jahraus & Associates Consulting Inc. and funded by the forests-for-tomorrow program²⁴, the authors conclude:

The sample suggests that, overall, dead pine trees comprise just over half of the total whole stem volume (live plus dead, at 7.5cm+ dbh) in the 100 Mile House TSA.

At the disbanded Research Branch in Victoria, Adrian Walton, using the BC Mountain Pine Beetle projection model – developed by Marvin Eng -- has refined the projection with the results of the annual aerial forest health overview²⁵. Marvin Eng, now with the Forest Practices Board, has taken Walton's data and studied the percent of stand timber volume killed for red and grey attack by cumulative percent of area affected by the mountain pine beetle attack. For 2009, Eng's analysis indicates that 74 per cent of the area affected by mountain pine beetle has less than, or equal to, 45 per cent of the timber volume "killed"²⁶. For most mature stands, a 46 per cent or greater loss in stand volume would result in unacceptable stocking and NSR status²⁷. This means that in Eng's analysis 26 per cent or more of the area disturbed by mountain pine beetle may be NSR.

All such projections are not without their challenges, it must be acknowledged. That is because the outcomes of a beetle attack will vary depending on a range of factors including the species composition of the stand attacked, the age of the trees in the stand, the density of the trees, and other factors. All of this adds complexity when it comes to estimating the extent of inventory gross NSR.

However, in the field, forest ministry staff anecdotally say that inventory gross NSR area is worse than the BCMPB projection model portrays with estimates of NSR ranging from 30 to 60 per cent of the total area disturbed by mountain pine beetle depending on the stand description and where in the province. More rigorous and frequent fieldwork would be of obvious value in helping to clarify the matter. But it is likely that such clarifications would lead to increases in estimates of the amount of forest deemed not satisfactorily restocked. Ministry forests-for-tomorrow staff, for example, surveyed 360,000 hectares of forestland disturbed by the 2003 and 2004 fires and by the mountain pine beetle and found 240,000 hectares of NSR (*Times Colonist*, June 12, 2010).

Finally, the reader must bear in mind that much of this research and estimation would be unnecessary if the forest inventory were not out-of-date, unreliable and grossly under-funded. The forests ministry should be able to tell its landlord, the public, with certainty how much of the

²³ Cerezke, H.F. 2009. "Climate Change and Alberta's Forests". Forest Health Section, Forestry Division, Alberta Sustainable Resource Development. Page 44

²⁴ Ministry of Forests and Range. Forests For Tomorrow. 2010. "100 Mile House TSA understory sampling". Prepared for Erafor Forestry Ltd. and Forests For Tomorrow, March 2010. 66 pages.

²⁵ Ministry of Forests and Range, Research Branch. 2009. "Provincial-level projection of the current mountain pine beetle outbreak: Year 7 at: <http://www.for.gov.bc.ca/hre/bcmapb/Year7.htm>

²⁶ Eng, Marvin. Personal communication (January 17, 2011)

²⁷ Personal communication with a renowned inventory consultant, who wishes to remain anonymous (January 17, 2011)

pine-affected forests is not adequately stocked with trees and how much of that area is economically suitable for tree planting.

SO WHAT MIGHT THE TRUE NSR PICTURE BE? To answer that question it is important to estimate the present total NSR, area. Such an estimate can draw on the following:

1. The inventory gross NSR on the forest ministry's books for fiscal year 2000/01, but not updated since, is 2.762 million hectares.
2. 70 per cent of the area burned by wildfire from 1998/99 to 2009/10 [$0.7 \times 1,076,643$], adds another 753,650 hectares to the area of inventory gross NSR.
3. 30 per cent of the area infested by mountain pine beetle from 1998/99 to 2009/10 [$0.30 \times 16,256,880$] is similarly considered inventory gross NSR, which adds another 4.877 million hectares to the total.
4. An estimated 200,000 hectares of inventory gross NSR from small-scale salvage logging conducted since 2000/01 and on which the provincial government waived the logging companies of reforestation responsibilities. This NSR area could be greater.
5. Finally, an estimated 0.5 million hectares of additional inventory gross NSR from other forest health disturbances incremental to endemic losses and attributable to climate change²⁸ [such as *Dothistroma*, pest complexes, decline syndromes, failed mid-term reforestation, reversion of planted areas to brush, defoliators (e.g., western spruce budworm), bark beetles other than MPB, stem rusts, root diseases, immature pine stands killed by the MPB, and drought since 1998/99]. Note: Funding for monitoring of post-free-growing stands and of the implications of climate change for forest health is woefully inadequate. Therefore, this figure could well be one million hectares or more.

This gives an estimated total NSR area of 9.1 million hectares.

From 1988/89 to 2000/01, the average ratio of total (inventory gross) NSR to silviculture net NSR is 3:1 (see Table 1). If this ratio were applied to the present estimated total NSR area of 9.1 million hectares, the estimated area of silviculture net NSR economically feasible for tree planting would be 3.0 million hectares.

If a more conservative ratio, say 4:1, were applied to the present estimated total NSR area of 9.1 million hectares, the estimated area of silviculture net NSR economically feasible for tree planting would be 2.3 million hectares. Minister Bell's publicly stated estimate in response to criticisms about the province's lack of zeal when it comes to reforestation is 10 per cent of that figure.²⁹

The true area of silviculture net NSR economically feasible for tree planting may lie within the range of 2.3 to 3.0 million hectares. Owing to some extensive landscapes affected by mountain pine beetle being remote from roads (e.g., western half of the Quesnel TSA), this paper estimates the area of silviculture net NSR economically feasible for tree planting to be 2.3 million hectares.

²⁸ Woods, A.J., Heppner, D., Kope, H.H., Burleigh, J. and MacLachlan, L. 2010. "Forest health and climate change: A British Columbia perspective". *The Forestry Chronicle*. Vol. 86, No. 4

²⁹ See Pat Bell, *Times Colonist* (June 12, 2010) and Graham Ross-Smith, *Times Colonist* (June 18, 2010). Also see Appendix 1 in which both letters are reprinted in full.

WHAT'S AT STAKE? In summary, this paper concludes that the present areas for inventory gross NSR and silviculture net NSR are estimated to be 9.1 and 2.3 million hectares, respectively.

This represents a serious forest policy problem of the first order. The provincial chief forester's stocking standards are the benchmark by which foresters manage forest renewal in the public interest. To know how much land is not stocked and to be able to estimate for how long that land will remain out-of-production for growing trees are critical building blocks in setting sustainable logging rates over time.

The forest ministry's current timber inventory process is both bereft of staff and budgets (budgets both for staff and contractors) and therefore is unable to capture and report the true extent of inventory gross NSR. This statement is supported by ministry annual reports since 2000/01 and by all three editions of the forest ministry's flagship report, *The State of British Columbia's Forests*, in which the ministry fails to report on total NSR -- the actual extent of inadequately re-stocked or re-forested public forestland. Also, performance reporting on reforestation in forest ministry service plans has been incomplete to the point of being misleading to the public.

Given the unprecedented estimated total area of NSR – 9.1 million hectares – and the wholly inadequate forest ministry response, it is clear that the public interest is not being served and forest management on publicly owned lands in British Columbia is unsustainable. To highlight the point, consider the following:

Since 2005/06, provincially funded reforestation efforts resulted in the planting of just 26,680 hectares of NSR forestlands. In other words, over five years the province could only manage to plant roughly one per cent of the area of land that this paper conservatively estimates to be economically feasible and desirable to replant. It does not take much to see that at such paltry levels of reinvestment in our public forestlands we will never come close to addressing the growing reforestation crisis on our hands, thus condemning the residents of our super-natural, beautiful province to an impoverished future.

Unsustainable forest management not only places the province's water, soil and biological diversity at risk of further deterioration but it is also a blatant affront to local communities dependent on forestry. By deliberately suppressing and misreporting the NSR issue, the government is shirking its responsibility as the public's forest agent and has shamefully betrayed the public trust. Effectively, the government has written off the mountain pine beetle infestation as a rural community problem and has condemned the economic future of some interior forestry industry towns to the dustbin of a sunset industry.

With unconscious adherence to a corporate ideology that knows the price of everything and the value of nothing, our government has effectively abandoned managing public forests in the public interest, making the scantest of investments in assessing how significantly under-stocked our forests are and committing even fewer resources to restoring our forests to a healthy state for the benefit of this and future generations.

APPENDIX 1
PUBLIC CONCERN AND MEDIA COVERAGE

Vancouver Sun:

- Opinion editorial: "B.C.'s reforestation crisis shows province an environmental laggard" by Arnold Bercov, George Heyman and Ben Parfitt (April 28, 2010)
- Opinion editorial: "BC Forest Service felled by bureaucracy" by Anthony Britneff (November 5, 2010). Also concurrently published in *The Calgary Herald*.
- Letter: "B.C.'s forests need leadership" from Bob Peart (November 10, 2010)
- Opinion editorial: "Cuts to forest service are too deep" by Ben Parfitt (December 8, 2010)
- Opinion editorial: "Certification fails to protect B.C. forests" by Anthony Britneff (Dec 19, 2010)
- Letter: "Rigid environmental standards used in forest certification" from Pat Bell (Dec 24, 2010)

Times Colonist:

- Opinion editorial: "Neglect in the woods: No way to manage a forest" by Anthony Britneff (June 10, 2010)
- Letter: "Forest land failure threatens future" from Tom Lester (June 12, 2010)
- Letter: "Replanting tress still the law" from Pat Bell (June 12, 2010)
- Letter: "Government failing to protect forests" from Ben Parfitt (June 12, 2010)
- Letter: "Public forests placed at risk" from Andrew Mitchell (June 12, 2010)
- Letter: "Minister confirms replanting failure" from Graham Ross-Smith (June 18, 2010)
- Letter: "Ministry changes destroy forest research" from Anthony Britneff (Nov. 24, 2010)
- Letter: "Province dismantling forest management" from Harry Drage (Nov. 24, 2010)
- Letter: "Full inquiry needed into forest policies" from Hank Doerksen (December 3, 2010)

Focus Magazine:

- Feature article: "The Big Burn" by Briony Penn (August 2010)
- <http://www.focusonline.ca/?q=node/71>

Canadian Centre for Policy Alternatives and Sierra Club BC:

- Article: "Axed: A decade of cuts to BC's forest service" by Ben Parfitt (December 2010)
- CCPA Blog: Pat Bell's YouTube Foray – Sowing Seeds of Misinformation (September 21, 2010)
- <http://www.policynote.ca/pat-bells-youtube-foray-sewing-seeds-of-misinformation/>

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- Feature article: "NSR in BC: Too important for guesswork" by John Betts (July 20, 2010)
- <http://www.wsca.ca/index.php?Page=225.0&Key=793>

Courier-Islander; North Island Gazette; and Barriere Star Journal:

- Letter: "Who's looking after BC's forests?" from Sharon L. Glover, CEO ABCFP

British Columbia Forest Society at: <http://www.forestssociety.com/>

Green BC Communities at: <http://www.greenbccommunities.com/>

B.C. Ministry of Forests Replanting trees still the law, *Times Colonist*, June 12, 2010

Re: "Neglect in the woods: No way to manage a forest," June 10.

Reforestation is still the law in B.C. Since 1987, forest companies have been legally required to reforest the areas they harvest.

In spring 2005, the Ministry of Forests introduced the Forests for Tomorrow program to reforest the areas that licensees were not harvesting and that were impacted by the devastating wildfires of 2003 and 2004 and the mountain pine beetle infestation. Since it was established, \$161 million has been spent on surveying 360,000 hectares and planting more than 40 million seedlings. Funding for the program will continue at about \$42 million each year.

The ministry estimates the current size of "not sufficiently restocked" (NSR) land to be 240,000 hectares -- not nine million hectares. Areas are surveyed each year and the estimated size of the NSR reported publicly.

Our silviculture discussion paper is exploring ways to increase private investment for intensive silviculture and establish a carbon-offset credit program that could be used to restore beetle-killed forests.

Pat Bell
Minister of Forests and Range

Minister confirms replanting failure, *Times Colonist*, June 18, 2010

Seldom does the *Times Colonist* produce two plums as ripe as the opinion article by forester Anthony Britneff ("Neglect in the woods: No way to manage a forest," June 10) and Forest Minister Pat Bell's response ("Replanting trees still the law," June 12).

In his zealotry to cover up the extent of British Columbia's "not sufficiently restocked" crisis, Bell has confirmed the truth of Britneff's analysis.

Taking Bell's own figures (360,000 hectares of surveyed pest- and fire-killed land produce 240,000 hectares of NSR), I calculate that if the forest service surveyed the full extent (16 million hectares) of fire- and pest-killed land, the total would be 10.7 million hectares.

Ironically, Bell corroborates Britneff's assertion that the extent of provincial "not sufficiently restocked" land is around nine million hectares.

Graham Ross-Smith
Shawnigan Lake

APPENDIX 2

GLOSSARY OF TERMS AND DEFINITIONS**INVENTORY DEFINITIONS**

Disturbed stocking doubtful (DSD). Areas disturbed by natural events where satisfactory stocking is doubtful (e.g., wind throw). Not used for decades.

Non-commercial brush (NC Br). Areas that have been invaded and 60-percent or more covered by brush one or more metres high.

Not satisfactorily restocked (NSR). Areas on which forest stands have been disturbed over 75 percent by fire, harvesting or other causes and have not restocked with sufficient trees of commercial species. Sometimes referred to as "inventory NSR", "gross NSR" or "inventory gross NSR".

Not stocked. Includes all NSR, DSD, NC Br inventory classifications.

Productive forestland. Forestland that is capable of producing a merchantable stand within a reasonable length of time.

SILVICULTURE DEFINITIONS

Current NSR. Silviculture net NSR with a date of origin after October 1, 1987. It is derived from inventory gross NSR (not stocked area) netted down for all low sites and for other criteria such as inoperability, inaccessibility, commercial/economic infeasibility and return on investment (i.e., includes only good, medium and some poor sites).

Pre-1982 backlog NSR. Silviculture net NSR with a date of origin prior to December 31, 1981. The statistic is derived from inventory gross NSR (not stocked area) netted down for all poor and low sites and for other criteria such as inoperability, inaccessibility, and commercial/economic infeasibility (i.e., includes only good and medium sites).

Pre-1987 backlog NSR. Silviculture net NSR with a date of origin between January 1, 1982 and October 1, 1987. The statistic is derived from inventory gross NSR (not stocked area) netted down for all low sites and for other criteria such as inoperability, inaccessibility, and commercial/economic infeasibility (i.e., includes only good, medium and poor sites).

Silviculture Net NSR. The area of inventory gross NSR deemed economically feasible and practicable to plant. It is determined by factoring the inventory gross NSR for natural regeneration, for accessibility and operability, and for potential return-on-investment (ROI) netting out low (and often poor) sites.